OLYMPIC VIEW RESOURCE AREA

YEAR 3
ANNUAL MONITORING REPORT
2005

City of Tacoma
February 23, 2006

Tacoma

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1.0 INTRODUCTION

This document presents the Year 3 Annual Monitoring Report for the Olympic View Resource Area (OVRA) Removal Action located in Tacoma, Washington (Figure 1). The City conducted the Year 3 physical and chemical monitoring activities in the spring and summer of 2005.

The OVRA is located within the boundaries of the Commencement Bay Nearshore/Tideflats Superfund Site and includes approximately 12.9 acres of intertidal and subtidal area. The Removal Action involved excavation, backfilling, and capping of approximately 2.3 acres of contaminated marine sediments within the OVRA site. Chemical constituents of concern included dioxins (polychlorinated dibenzodioxins and dibenzofurans), metals (arsenic, copper, mercury, and zinc), polycyclic aromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs).

To evaluate alternatives for the Removal Action, the City prepared an Engineering Evaluation/Cost Analysis (EE/CA) in April 2001. The EE/CA summarized results of previous environmental investigations at the OVRA site. Following a public comment period, the EPA published an Action Memorandum in July 2001, which documented the selected alternative for the OVRA Non-Time-Critical Removal Action. Final Design Documents describing site construction activities for the Removal Action were completed in January 2002. The City completed sediment excavation and capping for the OVRA Removal Action in October 2002, and submitted a Removal Action Completion Report (RACR) to the U.S. Environmental Protection Agency (EPA) in March 2003. All design, construction, and reporting tasks for the OVRA Removal Action were completed in accordance with requirements of an Administrative Order on Consent (AOC – Docket Number CERCLA 10-2001-0069 dated July 2001) between the City and EPA. The City submitted the final Long-Term Monitoring and Reporting Plan (LMRP) to the U.S. Environmental Protection Agency (EPA) in August 2003.

The Year 1 Annual Report was submitted to EPA in final form on April 20, 2004, and approved by EPA on April 21, 2004. The Year 2 Annual Report was submitted to EPA in final form on November 30, 2004, and approved by EPA on December 14, 2004.

2.0 PROJECT OBJECTIVES

The removal action objective for the OVRA, as described in the 2001 AOC and EPA's 2001 Action Memorandum, is to:

- Significantly reduce the potential risk to human health and/or marine ecological receptors resulting from potential exposure to contaminants present in sediments by removing and disposing of the contaminated sediment at an acceptable disposal site, or capping contaminated sediments in the project area.

The goals of the long-term monitoring program for the OVRA are to ensure that the selected cleanup action continues to be protective of human health and the environment. The specific objectives of the long-term monitoring program are to ensure that:

- The sediment cap continues to isolate toxic concentrations of previously identified chemicals of concern (COCs) in underlying sediments from marine biota and other biological receptors; and
- The sediment cap is not recontaminated with COCs from underlying sediments.

The integrity of the capped area is fundamental to achieving these objectives. Cap integrity depends upon maintaining the designed cap thickness to avoid potential contaminant releases, and to attain the performance standards. To ensure cap integrity, monitoring activities included the following:

- **Physical Integrity Monitoring.** Physical integrity monitoring was used to ensure that erosion is not occurring to an extent that would compromise the ability of the cap to physically isolate contaminated sediments from environmental receptors. As a result of comments by EPA on the Year 1 Annual Report, conventional transect surveys were conducted in April to monitor and document any potential for erosion.

- **Surface Sediment Quality Monitoring.** In Year 3, sediment quality monitoring was conducted to confirm that contaminants are not moving upward to the top of the cap via diffusion or other transport mechanisms.

3.0 MONITORING ACTIVITIES

3.1 Physical Integrity Monitoring

Physical integrity monitoring consisted of topographic surveys (both conventional, shore based and hydrographic) and visual inspections.

Crews from the City of Tacoma Public Works Department Survey Section, under the direction of the City's Licensed Professional Land Surveyor, conducted the conventional topographic survey transects (T0 through T4) in April 2005. The locations of these transects are shown in Appendix A, Sheet 1 and the data is listed in Table 1. These field activities were scheduled around the low tide events. Shore based surveys for vertical elevations have an accuracy of ±0.01 foot, and for horizontal control are accurate to ±0.01 feet.

Environmental professionals from the City of Tacoma Science and Engineering Division conducted visual inspections in April 2005 and again in August 2005.

Manson Construction Company (MCC) conducted hydrographic survey transects (T5 and T6) over Area E under the direction of KPFF Consulting Engineers in early October 2005. The locations of these transects are shown in Appendix A, Sheet 1 and the data is listed in Table 2.

Survey equipment included Electronic Positioning System (EPS) for horizontal control and a high resolution depth sounder with radio tide gauge for vertical control. Accuracy standards are ±0.25 feet in the vertical and ±3.0 feet in the horizontal. MCC quality control procedures include a pre-survey check of vertical accuracy on their radio tide gauge located at Petrich Marine Dock in the Foss Waterway. MCC has several tide gauge boards on pilings at the Petrich Marine Dock that were surveyed in with conventional survey techniques. The pre-survey check involves comparing the radio tide gauge with the conventionally surveyed tide gauge boards and recalibrating the radio tide gauge if there is a 0.1 foot difference or greater.

City of Tacoma Public Works personnel performed a hydrographic survey in August 2005 per the LMRP. Results from this survey were obviously inaccurate and are not reported here. The City consulted with EPA and it was decided to resurvey with MCC (as described above and consistent with the Contingency Planning Process – see Figure 5 of the LMRP), while the City investigated the source of the error. Subsequent investigations found that the radio tide gauge

(located at Martinac Shipyard Dock) used by the City during the faulty survey was reading incorrectly. In a direct comparison with MCC's conventional tide gauge boards and the NOAA on-line tide gauge for Commencement Bay, it was discovered that the City's radio tide gauge was off by more than a foot. See Section 7.0 for revisions to future monitoring procedures.

3.2 Surface Sediment Quality Monitoring

The LMRP requires surface sediment chemistry sampling to ensure the cap continues to isolate toxic concentrations of previously identified chemicals of concern (COCs) in underlying sediments and that the cap is not recontaminated with COCs from underlying sediments. The samples and analyses called out in the LRMP for Year 3 sediment chemistry monitoring are listed in Table 3.

Sampling for surface sediment chemistry was accomplished on August 23, 2005 and August 31, 2005. The samples on August 23, 2005, (E-2 and C-5) were collected by van Veen from a boat. The August 31, 2005, field effort was conducted at low tide and samples (A-1, A-2, B-1, B-2 and D-1) were obtained from the beach. An Electronic Positioning System (EPS) was used to document the locations of the grab samples. Sampling techniques were consistent with the requirements of the LRMP. Each sample was the composite of three individual grab samples from within the sampling grid (i.e. grabs A1-1, A1-2 & A1-3 were composited to form sample A-1). These sample locations are shown in Appendix A, on Sheet 1 and are listed in Table 4. Qualitative sample characteristics were recorded for each sample and these forms are presented in Appendix B.

Samples were transported under chain of custody to the laboratory for analysis. Analyses for PCBs were analyzed by Severn Trent Laboratories-Seattle, Dioxins were analyzed by Severn Trent Laboratories-Sacramento, and metals were analyzed by the City of Tacoma's Science and Engineering Laboratory. All labs are Washington State Department of Ecology-accredited for the analyses performed. All analyses were conducted in accordance with the LMRP.

In addition to the field samples listed in Table 4, Quality Control samples were collected in the field as well. The field duplicates for samples A-1 and B-1 were prepared by homogenizing sediment for the composite sample and filling two separate containers. The duplicate was submitted as a separate sample to the lab for analysis. An equipment rinseate blank was collected in the field by rinsing sampling equipment with deionized water. The rinseate water was submitted to the lab for analysis of all constituents.

4.0 MONITORING RESULTS

4.1 Physical Integrity Monitoring Results

Results of survey transects are presented in Table 2 and graphically depicted in Appendix A, Sheets 2 and 3. Early warning levels are set at a loss of cap material of 0.5 feet between the as-built survey and the monitoring results in Areas A, B, and D, and again at a loss of 1 foot of material in these areas. The early warning value is set at the loss of 1 foot of cap material in Area E. Early warning levels are not performance standards, but are set at more stringent levels to assess whether performance standards could be exceeded in the future. The performance standards are set at minimum cap thickness in Table 1 of the LMRP.

The survey monitoring results show no exceedance of the Performance Standards. Additionally, Year 3 results show no exceedance of the Early Warning Values as well.

Visual inspections were conducted during April and August 2005. Photos and notes from the inspections are presented in Appendix C. Areas with erosion protection material were probed to confirm the presence of this larger rock. The erosion protection material appears to have remained stable and is covered in areas with a sandy gravel – likely the habitat mix from the construction activities. The erosion protection material is estimated to be several inches thick, with a minimum of 3 to 4 inches. It appears from the visual inspections and the elevation surveys that the erosion protection material coverage is similar to the post construction condition. There are no apparent signs of significant erosion. Additionally, close up photos of the sediments were taken as requested in EPA comments on the Year 1 Annual Report and included in Appendix C.

There have been no exceedances of the performance standards for physical integrity monitoring. Therefore, the removal action has been successful, to date, in the physical isolation of contaminated sediments from environmental receptors.

4.2 Surface Sediment Quality Monitoring Results

Laboratory results from the sampling described in Section 3.2 are presented in Table 5. None of the chemical analytes have exceeded the early warning values or the performance standards. Laboratory analysis was conducted according to the provisions of Appendix A of the LMRP. The data reports, QA/QC information, and data validation reports for the Year 3 monitoring samples are presented in Appendix D of this report. Data, as reported, was of an acceptable quality.

All metals concentrations were significantly less than the OVRA Sediment Quality Criteria (SQC), provided in Table 2 of the LMRP.

All PCB analyses were quite low as well. The reporting limits for the Year 3 results are nearly an order of magnitude less than the last round of PCB monitoring data in Year 1. Therefore, while detections are reported now which were not reported before, this is very likely due to the dramatic drop in reporting level. Additionally, the Washington State Department of Ecology conducted some PCB analyses in April 2004 in the adjacent upland as a part of a proposed Olympic View Triangle development investigation. That data showed no detections of PCBs at reporting limits of 13-14 ug/Kg.

Dioxin Toxic Equivalents (TEQs) ranged from 0.7 to 7.1 ng/Kg, substantially less than the SQC of 20 ng/Kg. TEQs were calculated from the individual congener concentrations using the Toxic Equivalence Factors developed by the World Health Organization [Van den Berg, et al. (1998). Toxic Equivalency Factors (TEFs) for PCBs, PCDDs, PCDFs for Humans and for Wildlife. Environmental Health Perspectives 106, 775].

All chemical concentrations are non-detect or low level and less than the early warning value (EWV) of one half of the SQC. Therefore, sediment quality monitoring has confirmed that contaminants are not moving upward to the top of the cap via diffusion or other transport mechanisms.

The field duplicate results showed generally good agreement between the splits. 2,3,7,8-TCDD showed higher than anticipated variability between field duplicates, however, the results for both samples were less than the EWV. The rinseate blank had detections of zinc, lead and copper. However, the associated samples had very low levels and no data quality was affected. The

potential sources of the contamination included: the water used to generate the rinseate blank sample, the equipment that the water rinsed to form this field blank, and the container that was used to hold the equipment rinseate blank sample. The lab looked at the water as it was contained on the sampling truck (vehicle) in a stainless steel container and believes it is the likely source of the contamination. The procedure used to collect the equipment rinseate blank followed the QAPP, however, in the future rinseate blank water will be carried into the field in the same type of container that will be used to carry the rinseate blank sample back to the lab.

5.0 CONTINGENCY PLANNING AND RESPONSE

Year 3 monitoring results have confirmed the continuing success of the Removal Action at the OVRA. Based on Year 3 monitoring results, no contingency actions are required.

6.0 SITE ACCESS AND INSTITUTIONAL CONTROLS

6.1 Restricted Navigation Buoys

The City was notified in July 2005 that the Restricted Navigation Buoys for this site were missing. The City then notified EPA. The City procured three new buoys and had them installed in October 2005, per Coast Guard requirements and in accordance with the institutional controls required by EPA.

7.0 FUTURE MONITORING REVISIONS

Due to issues related to radio tide gauge accuracy during hydrographic survey, all future hydrographic monitoring events will include a pre-survey check of radio tide gauge accuracy versus conventionally surveyed tide gauge boards or NOAA's on-line tide gauge for Commencement Bay. The link is http://tidesonline.nos.noaa.gov/geographic.html, and you must drill down into Station 9446484 Tacoma, WA.

Table 1 – Conventional Survey Transect Elevations (elevations in feet MLLW unless noted otherwise)

Transect	Capped Area	As built Elevation	Year 1 Monitoring	Diff.[1] b/w Year 1 & As built	Year 2 Monitoring	Diff b/w Year 1&2	Diff b/w Year 2 & As built	Year 3 Monitoring	Diff b/w Year 2&3	Diff b/w Year 3 & As built	> Early Warning
T0[2]	B				6.1			6.8	0.7		No
T0	B				3.4			3.8	0.4		No
T0	B				1.2			1.2	0.0		No
T0	No Cap				0.3			0.5	0.2		
T0	No Cap				0.1			0.0	-0.1		
T0	No Cap				0.1			0.0	-0.1		
T0	No Cap				-0.3			-0.1	0.2		
T0	No Cap				-0.6			-0.5	0.1		
T0	No Cap				-0.8			-0.9	-0.1		
T0	No Cap				-1.2			-1.4	-0.2		
T0	No Cap				-1.7			-1.7	0.0		
T0	No Cap				-1.8			-1.8	0.0		
T1	B	6.8	7.8	1.0	8.3	0.5	1.5	8.5	0.2	1.7	No
T1	B	4.8	5.2	0.4	5.4	0.2	0.6	6.0	0.6	1.2	No
T1	B	3.0	2.8	-0.2	2.5	-0.3	-0.5	3.3	0.8	0.3	No
T1	B	1.8	0.9	-0.9	0.8	-0.1	-1.0	3.0	2.2	1.2	No
T1	No Cap	1.0	0.7	-0.3	0.6	-0.1	-0.4	1.1	0.5	0.1	
T1	No Cap	0.6	0.5	-0.1	0.5	0.0	-0.1	0.6	0.1	0.0	
T1	No Cap	0.3	0.4	0.1	0.4	0.0	0.1	0.6	0.2	0.3	
T1	No Cap	-0.1	0.2	0.3	0.1	-0.1	0.2	0.2	0.1	0.3	
T1	No Cap	-0.2	-0.1	0.1	0.0	0.1	0.2	0.3	0.3	0.5	
T1	No Cap	-0.5	-0.7	-0.2	-0.7	0.0	-0.2	-0.2	0.5	0.3	
T1	No Cap	-1.0	-1.0	0.0	-0.9	0.1	0.1	-0.7	0.2	0.3	
T1	No Cap	-0.9	-1.5	-0.6	-1.4	0.1	-0.5	-1.5	-0.1	-0.6	
T2	No Cap	13.1	13.5	0.4				12.8		-0.3	
T2	No Cap	11.3	10.6	-0.7				10.0		-1.3	
T2	No Cap	7.3	7.6	0.3				7.6		0.3	
T2	No Cap	4.5	4.6	0.1				5.3		0.8	
T2	No Cap	3.1	3.0	-0.1				3.3		0.2	
T2	D	2.3	2.2	-0.1				2.6		0.3	No
T2	D	2.0	1.8	-0.2				1.9		-0.1	No
T2	D	1.0	1.0	0.0				0.9		-0.1	No
T2	No Cap	0.1	-0.3	-0.4				-0.8		-0.9	
T2	No Cap	-1.7	-1.2	0.5				-1.2		0.5	

Transect	Capped Area	As built Elevation	Year 1 Monitoring	Diff.[1] b/w Year 1 & As built	Year 2 Monitoring	Diff b/w Year 1&2	Diff b/w Year 2 & As built	Year 3 Monitoring	Diff b/w Year 2&3	Diff b/w Year 3 & As built	> Early Warning
T3	A	15.0	14.9	-0.1				15.0		0.0	No
T3	A	12.3	12.3	0.0				12.0		-0.3	No
T3	A	9.4	9.6	0.2				9.6		0.2	No
T3	A	8.2	8.3	0.1				7.7		-0.5	No
T3	A	6.4	6.3	-0.1				6.0		-0.4	No
T3	No Cap	4.5	4.4	-0.1				4.6		0.1	
T3	D	2.5	2.5	0.0				2.8		0.3	No
T3	D	1.8	1.9	0.1				2.1		0.3	No
T3	C5	1.3	0.9	-0.4				1.2		-0.1	No
T3	C5	0.5	0.1	-0.4				0.3		-0.2	No
T3	C5	0.0	-0.1	-0.1				-0.3		-0.3	No
T4	A	14.5	14.6	0.1				14.5		0.0	No
T4	A	11.6	11.5	-0.1				11.5		-0.1	No
T4	A	8.3	8.3	0.0				9.0		0.7	No
T4	A	6.3	6.4	0.1				6.7		0.4	No
T4	No Cap	4.2	4.0	-0.2				4.7		0.5	
T4	No Cap	2.3	2.6	0.3				3.2		0.9	
T4	No Cap	1.8	1.6	-0.2				2.3		0.5	
T4	No Cap	1.5	1.3	-0.2				1.6		0.1	
T4	No Cap	1.2	1.3	0.1				1.5		0.3	
T4	No Cap	0.7	1.1	0.4				1.4		0.7	
T4	No Cap	0.2	0.5	0.3				0.6		0.4	
T4	No Cap	0.1	-0.2	-0.3				-0.3		-0.4	

1 – Survey accuracy is +/- 0.01 feet in the horizontal and the vertical.

2 – Transect 0 was added for the first time in year 2 monitoring. Year 2 will be the baseline for comparison in future monitoring events.

Table 2 – Hydrographic Survey Transect Elevations (in feet MLLW unless otherwise noted)

Transect	Capped Area	As built Elevation	Year 1 Monitoring	Diff.[1] (feet)	Year 3 Monitoring	Diff b/w Year 3 & As built	> Early Warning
T5	No Cap	-2.0	-3.0	-1.0	-2.1	-0.1	
T5	E	-1.0	-1.5	-0.5	-1.9	-0.9	No
T5	E	-3.5	-3.5	0.0	-2.9	0.6	No
T5	E	-2.9	-2.5	0.4	-2.7	0.2	No
T5	E	-4.0	-5.1	-1.1	-4.6	-0.6	No
T5	E	-4.0	-4.0	0.0	-4.5	-0.5	No
T5	E	-4.0	-5.1	-1.1	-4.7	-0.7	No
T5	E	-3.6	-3.5	0.1	-3.3	0.3	No
T5	No Cap	-2.8	-3.2	-0.4	-2.9	-0.1	
T6	No Cap	-4.1	-5.1	-1.0	-4.4	-0.3	
T6	E	-4.0	-3.6	0.4	-3.7	0.3	No
T6	E	-4.4	-4.0	0.4	-3.9	0.5	No
T6	E	-5.0	-5.6	-0.6	-5.4	-0.4	No
T6	E	-5.0	-6.9	-1.9	-5.8	-0.8	No
T6	E	-5.0	-4.6	0.4	-4.0	1.0	No
T6	E	-3.2	-3.7	-0.5	-2.9	0.3	No
T6	E	-3.0	-3.8	-0.8	-3.3	-0.3	No
T6	No Cap	-3.0	-3.4	-0.4	-3.1	-0.1	

1 – Survey accuracy is +/- 3 feet in the horizontal and +/- 0.25 feet in the vertical.

Table 3 – Samples and Analyses

Sampling Area	Analyses
A-1	Arsenic, Copper, Lead, Mercury and Zinc
A-2	Arsenic, Copper, Lead, Mercury and Zinc
B-1	PCBs and Dioxins
B-2	PCBs and Dioxins
C-5	Dioxins
D-1	Dioxins
E-2	Dioxins

Table 4 – Grab Sample Locations

Grab Sample	Northing	Easting
A1-1	709486.7	1160184.9
A1-2	709480.9	1160147.6
A1-3	709451.0	1160177.8
A2-1	709476.6	1160236.9
A2-2	709542.9	1160259.5
A2-3	709516.1	1160208.2
B1-1	709306.6	1159960.7
B1-2	709338.6	1159957.8
B1-3	709317.8	1159924.0
B2-1	709387.4	1160027.7
B2-2	709341.0	1160021.1
B2-3	709319.5	1160004.0
C5-1	709595.0	1160142.0
C5-2	709595.6	1160113.6
C5-3	709641.0	1160168.0
D1-1	709482.9	1160069.1
D1-2	709516.7	1160079.3
D1-3	709533.5	1160128.3
E2-1	709642.2	1159980.2
E2-2	709633.0	1159952.0
E2-3	709652.2	1159969.2

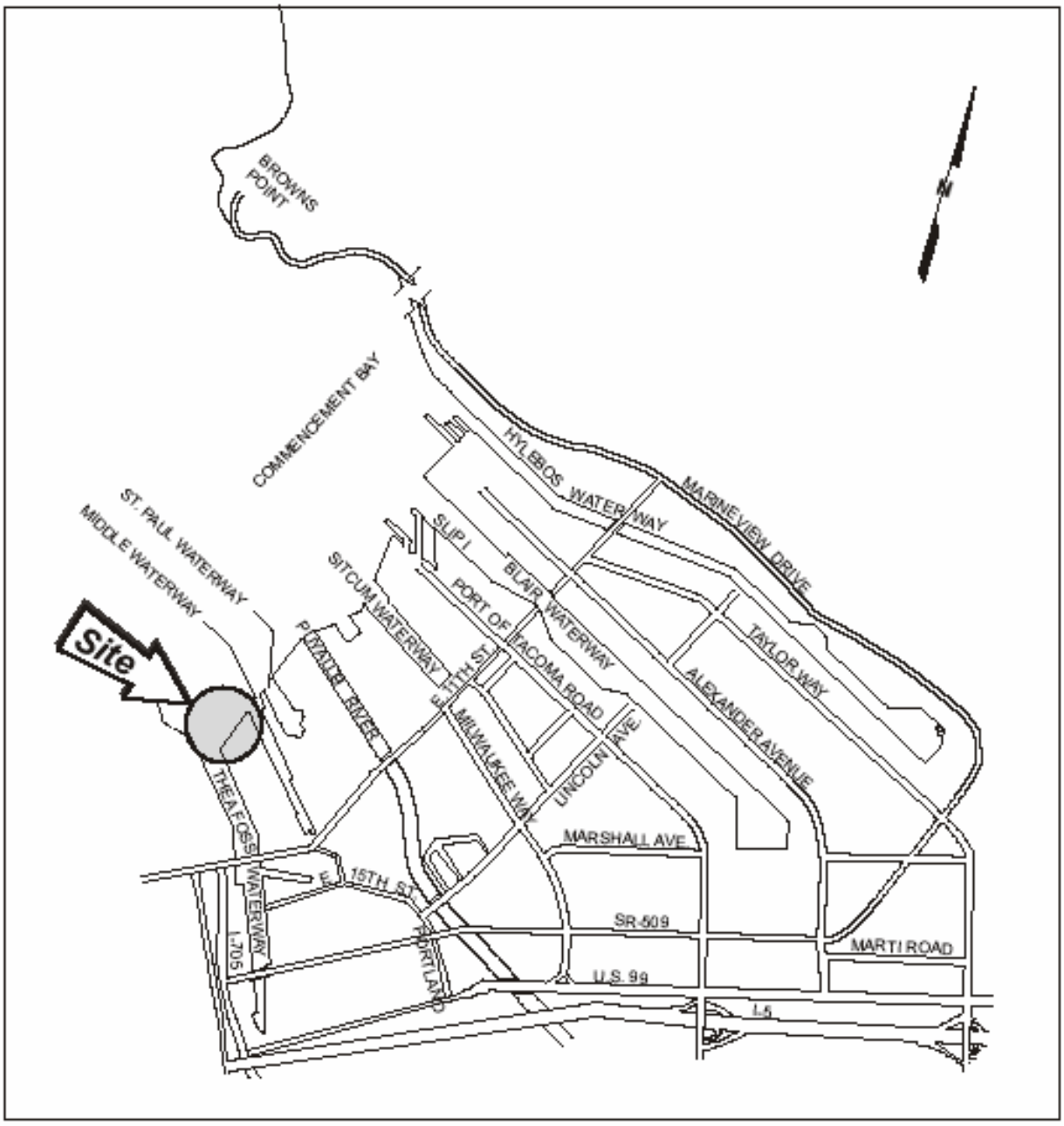
Table 5 - Surface Sediment Chemistry Data

Constituents	OVRA SQC	A-1 0-10cm	A-1 DUP 0-10cm	A-2 0-10cm	B-1 0-10cm	B-1 DUP 0-10cm	B-2 0-10cm	C-5 0-10cm	D-1 0-10cm	E-2 0-10cm	Rinse Blank (ug/L)
Metals (mg/kg)											
Arsenic	57	**1.1**	0.8 J	0.6 J							1.05 U
Copper	390	11.2 J	9.7 J	12.9 J							**139**
Lead	450	**1.4** J	**1.7** J	**1.4** J							**12.7**
Mercury	0.41	0.0110 UJ	0.0120 UJ	0.0110 UJ							0.05 U
Zinc	410	16.9 J	17.6 J	15.6 J							**312**
PCBs (ug/kg)											
PCB 1016					2.9 U	2.9 U	3 U				64 U
PCB 1221					2.9 U	2.9 U	3 U				64 U
PCB 1232					2.9 U	2.9 U	3 U				64 U
PCB 1242					2.9 U	2.9 U	3 U				64 U
PCB 1248					2.9 U	2.9 U	3 U				64 U
PCB 1254					7.2 J	7.4 J	5 J				40 U
PCB 1260					1.6 U	1.6 U	1.7 U				40 U
Total PCBs	300				7.2 J	7.4 J	5 J				
Dioxins/Furans (ng/kg)											
2,3,7,8 - TCDD					0.27 UJ	**5.7 J**	0.35 U	0.23 U	0.34 U	0.3 U	4.7 U
1,2,3,7,8 - PeCDD					0.49 U	0.86 U	0.76 U	0.54 U	0.52 U	0.67 U	7.1 U
1,2,3,4,7,8 - HxCDD					0.43 U	1.8 U	0.86 U	0.42 U	0.73 U	0.6 U	10 U
1,2,3,6,7,8 - HxCDD					1.1 U	2.1 U	2.1 U	0.39 U	1.3 U	0.52 U	8.7 U
1,2,3,7,8,9 - HxCDD					0.6 U	1.3 U	1.7 U	0.39 U	0.72 U	**0.55 J**	8.9 U
1,2,3,4,6,7,8 - HpCDD					**21**	**19**	**44**	**5.6**	**29**	**7.9**	6 U
OCDD					**150**	**110**	**340**	**41**	**240**	**72**	16 U
2,3,7,8 - TCDF					0.23 U	**0.55 J**	0.51 U	0.19 U	0.47 U	0.24 U	3.7 U
1,2,3,7,8 - PeCDF					0.37 U	0.53 U	0.43 U	0.3 U	0.38 U	0.4 U	5.1 U
2,3,4,7,8 - PeCDF					0.43 U	0.65 U	0.5 U	0.35 U	0.44 U	0.48 U	5.6 U
1,2,3,4,7,8 - HxCDF					0.387 U	0.85 U	1 U	0.46 U	0.69 U	**0.6 J**	7.4 U
1,2,3,6,7,8 - HxCDF					0.44 U	0.5 U	0.6 U	0.38 U	0.59 U	0.48 U	7 U
1,2,3,7,8,9 - HxCDF					0.37 U	0.43 U	0.53 U	0.3 U	0.52 U	0.45 U	4.5 U
2,3,4,6,7,8 - HxCDF					0.32 U	0.36 U	0.43 U	0.28 U	0.42 U	0.36 U	4.6 U
1,2,3,4,6,7,8 - HpCDF					**16**	**13**	**14**	**3.1 J**	**21**	**3.7 J**	3.6 U
1,2,3,4,7,8,9 - HpCDF					0.44 U	0.67 U	0.86 U	0.53 U	0.66 U	0.57 U	5.7 U
OCDF					**19**	**12**	**20**	**3.3 J**	**24**	4.3 U	8.8 U
Total TEQ	20				1.1	7.1	1.7	0.7	1.4	1.0	

U - The analyte was not detected at or above the reported value
UJ - The analyte was detected at or above the reported estimated value
J - The analyte was positively identified. The associated value is an estimate

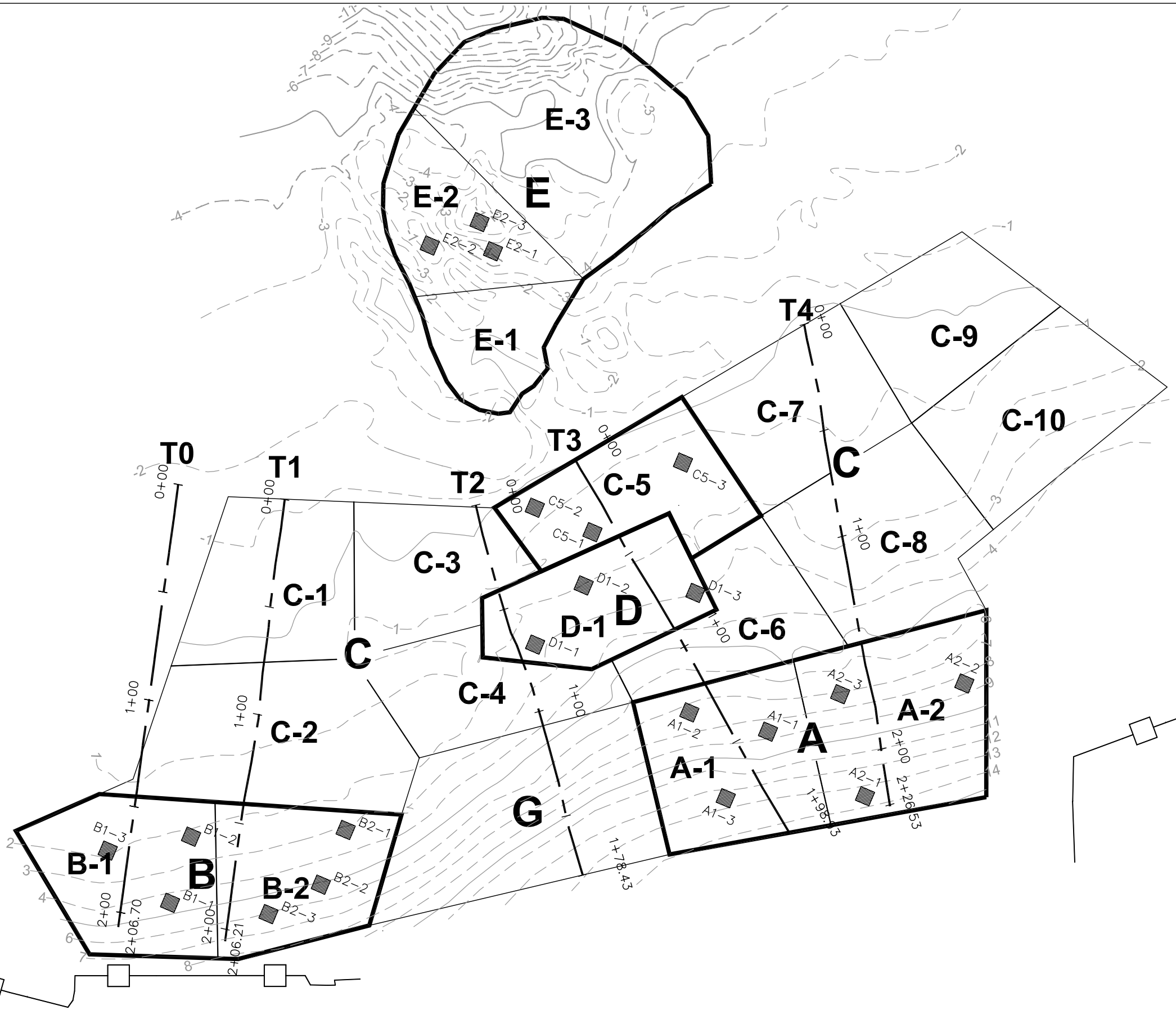
Figure 1

Vicinity Map



APPENDIX A

DRAWINGS



LEGEND:

C1-1

CAPPED AREAS ARE A,B,C-5,D, AND E AND SAMPLE POINTS

TRANSECTS

0 50'

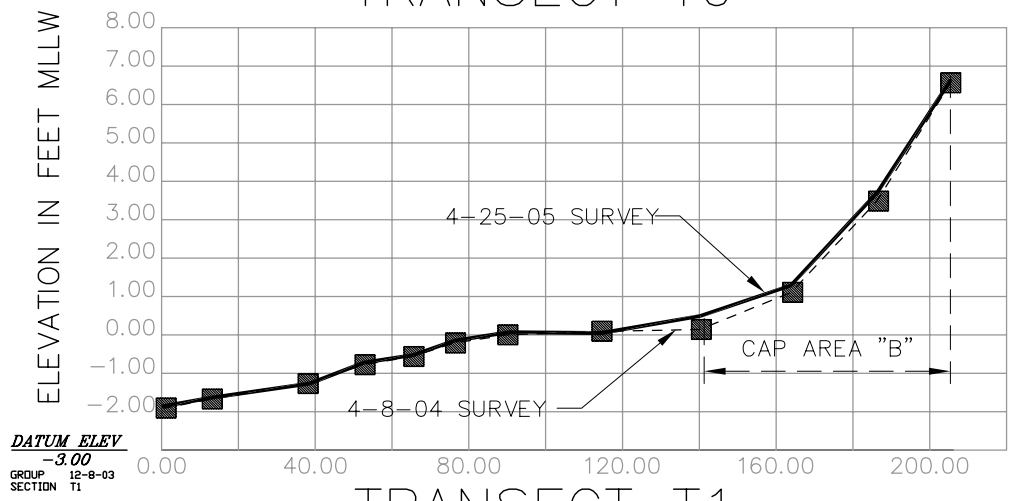
1"=50'

VERTICAL DATUM: MLLW ACOE

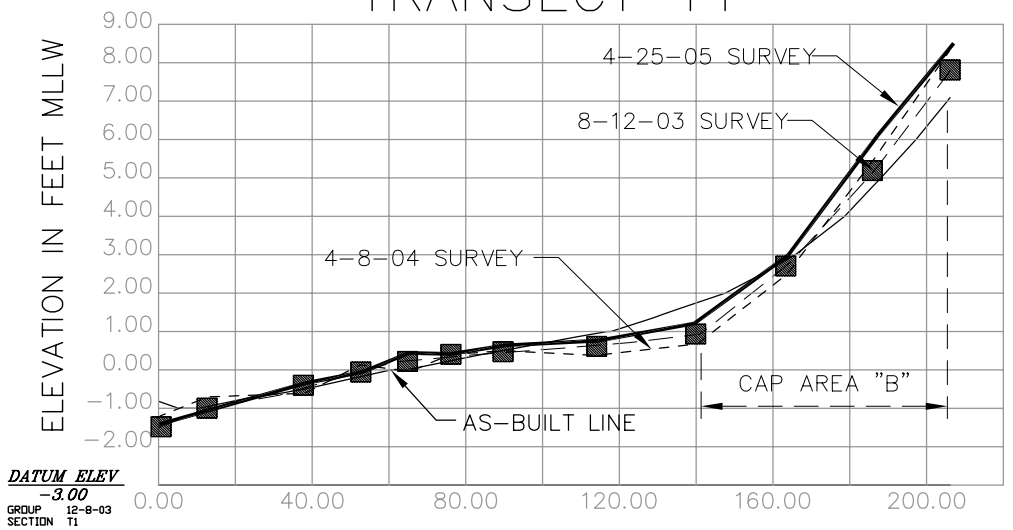
DATE 5-2-05	SCALE 1"=50'	CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS
DESIGNED JO	CHECKED JO	**OLYMPIC VIEW** **RESOURCE AREA** **YEAR 3 MONITORING REPORT**
DRAWN REG	PROJECT NAME AK80F6	AK80F6
DRAWING NAME 4-25-05-BASE		SHEET NO. SHEET 1 OF 3

I:\pw\environ\tces\projects\special projects\olympic view\DC1098\dwg\4-25-05-base.dwg, 11/21/2005 09:00:59 AM

TRANSECT T0



TRANSECT T1



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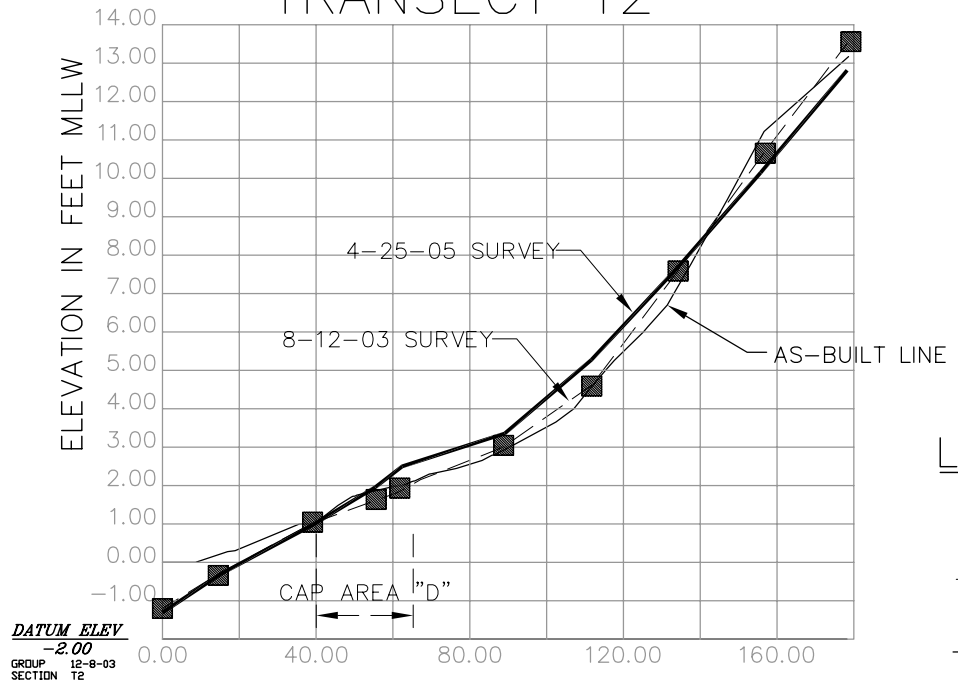
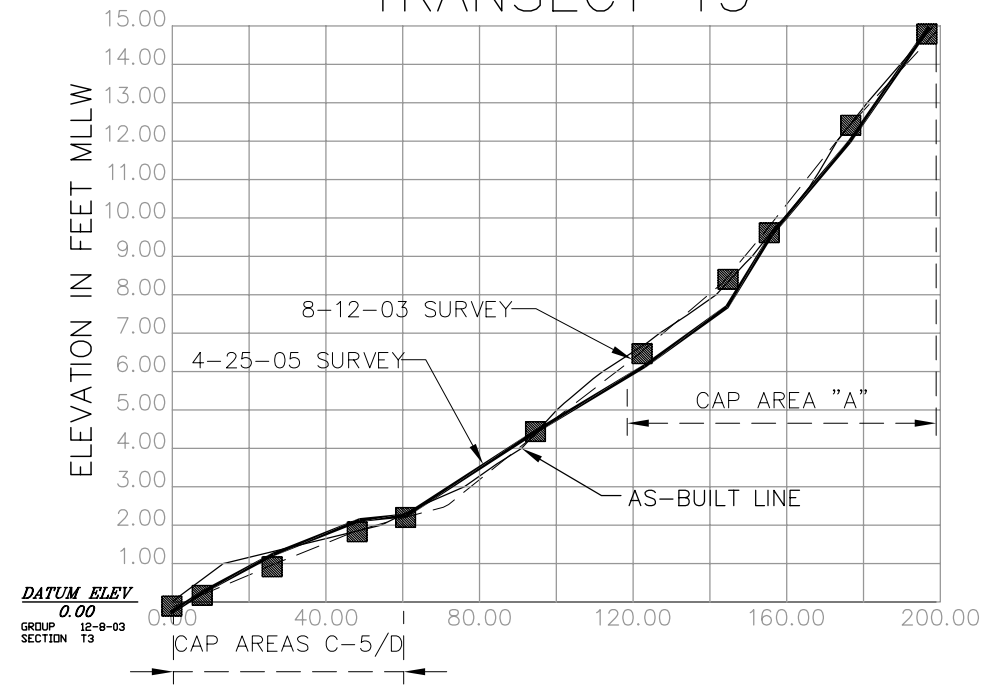
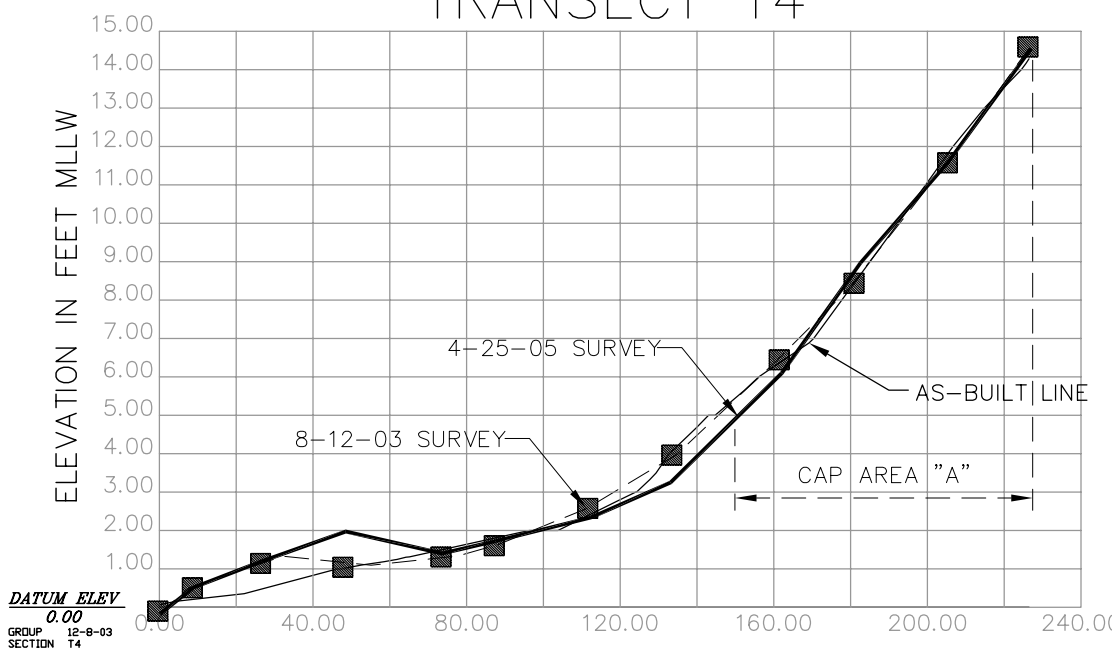


TRANSECT T3



TRANSECT T4



LEGEND:

- MONITORING POINT
- 8−12−03 MONITORING LINE
- 4−8−04 MONITORING LINE
- 4−25−05 MONITORING LINE
- AS−BUILT LINE

0 50' 0 5'

HORIZONTAL 1"=50' VERTICAL 1"=5'

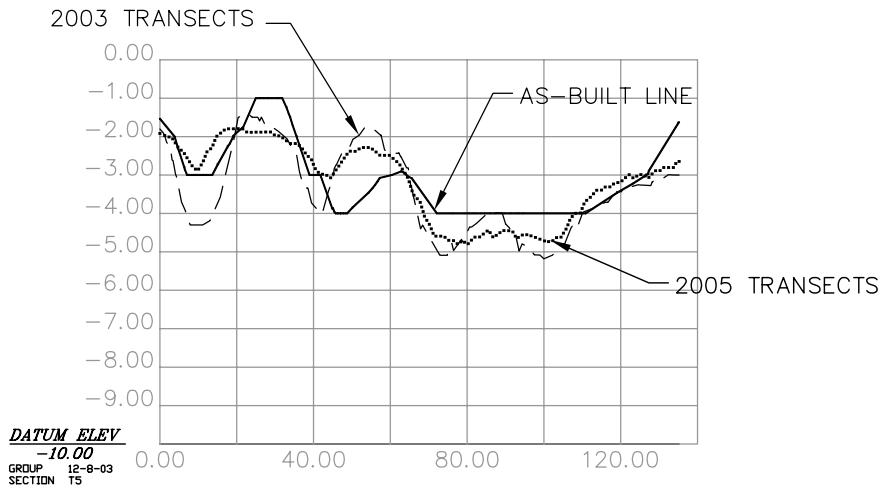
GENERAL NOTES FOR SHEETS 2 & 3

1. SEE SHEET 1 FOR PLAN VIEW OF TRANSECT LOCATIONS

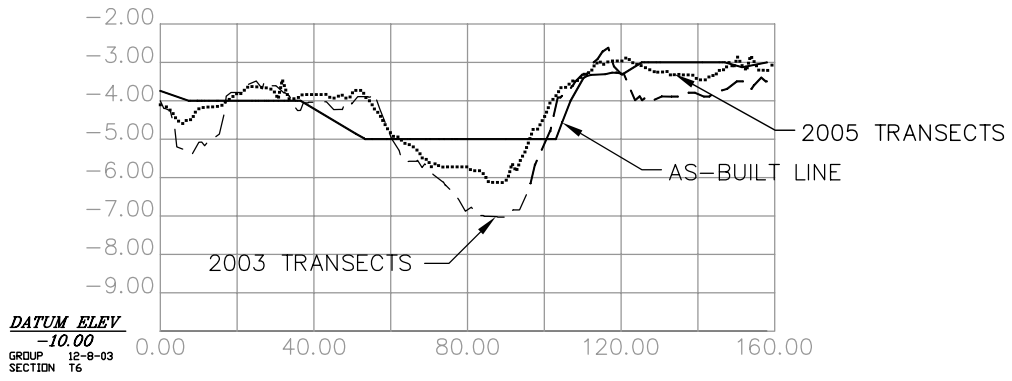
2. ELEVATIONS ALONG THE MONITORING TRANSECT LINES ARE INTERPOLATED BETWEEN THE DISCREET MONITORING POINTS WHICH ARE INDICATED BY BOXES ALONG THE LINES.

DATE: 5-2-05	SCALE: 1"=50'	CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS
DESIGNED: DP	CHECKED: JO	**OLYMPIC VIEW** **RESOURCE AREA** **YEAR 3 MONITORING REPORT**
DRAWN: REG	PROJECT NAME: AK80F6	AK80F6
DRAWING NAME: 4-25-05-BASE		SHEET NO. SHEET 2 OF 3

TRANSECT T5



TRANSECT T6



0 50'

HORIZONTAL 1"=50'

0 5'

VERTICAL 1"=5'

DATE: 11-21-05	SCALE: 1"=50'	CITY OF TACOMA DEPARTMENT OF PUBLIC WORKS
DESIGNED: JO	CHECKED: JO	**OLYMPIC VIEW** **RESOURCE AREA** **YEAR 3 MONITORING REPORT**
DRAWN: REG	PROJECT NAME: AK80F6	AK80F6
DRAWING NAME: 12-1-03-BASE		SHEET NO. SHEET 3 OF 3

APPENDIX B

QUALITATIVE SAMPLE CHARACTERISTICS FORMS

APPENDIX C

VISUAL INSPECTIONS: FIELD NOTES AND PHOTOS

Notes on Photo Point Monitoring

Photos were taken from locations noted in attached Figure 1 from the Maintenance, Monitoring and Adaptive Management Plan (MAMP). Title indicates in which direction the photo is looking.

APPENDIX D

LABORATORY REPORT & QA/QC INFORMATION